Public Disclosure Document

Title: Frequency-Selective Olfactory Emission System for Multisensory and Personal Scent Applications

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Abstract: This disclosure describes a system for delivering precisely controlled aromatic stimuli using ultrasonic frequencies to selectively evaporate target aromatic compounds from a mixed scent solution. The system supports wearable and pocket-size personal devices, smart fragrances, and synchronized large-scale olfactory experiences. It introduces the foundational concept of "Scent Music," where frequencies operate as the functional language of scent, akin to musical notes and chords. This disclosure further emphasizes the potential to directly excite pure aroma molecules (without carriers) based on their intrinsic resonance frequencies.

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1. Personal Olfactory Devices

A) Nosephone (Wearable)

- A compact, wearable device placed beneath or near the nostrils.
- Contains one or more scent capsules with:
    - A single scent mix containing multiple aromatic compounds, each engineered to evaporate under a specific ultrasonic frequency.
    - Or multiple scent cartridges activated by specific piezoelectric emitters.
- A mobile app or onboard UI allows the user to trigger selected ultrasonic frequencies to release desired scent notes.
- Multiple piezos can be activated simultaneously to form "scent chords," though a single wideband piezo can also emit a composite waveform to stimulate multiple frequencies simultaneously.

B) Scent Pocket (Non-Wearable Personal Device)

- A palm-sized, vape-like device.
- Operates identically to the nosephone, but is held up to the nose by hand and used in short aroma bursts (like puffing aroma instead of vapor).
- Designed for casual or ritual use — e.g., scent hits for meditation, creativity, memory, or mood.

- USB-charged, refillable capsule or scent pod system.

C) Frequency-Addressed Capsule Array (Small-Scale Option)

- A micro-scale personal device containing a fixed array of 6–10 scent capsules.
- Each capsule contains a single aroma compound with a unique viscosity, resonance, or chamber design.
- A single wideband piezoelectric transducer emits sweeping or targeted frequencies.
- Only the capsule tuned to the given frequency responds with evaporation, enabling scent selection without mechanical valves or multiple actuators.
- A single piezo can emit multiple frequency signals simultaneously, allowing the creation of scent chords by activating several capsules at once.
- Allows mobile-triggered scent switching, extremely compact design, and silent operation — ideal for portable or wearable implementations.

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2. Smart Fragrance Bottle

- A programmable perfume bottle that uses ultrasonic frequency targeting to emit specific scent molecules from a pre-mixed blend.
- The user selects a mode on the app (e.g., "fresh," "mystical," "evening") and the bottle emits the corresponding aromatic profile.
- Options:
    - **Single blend mode**: one bottle, full scent spectrum; scent selection by frequency.
    - **Multi-pod mode**: interchangeable cartridges, each activated separately.

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3. Immersive Scent Show Systems

- Large-scale ultrasonic diffusion systems integrated into:
    - Cinemas
    - VR headsets
    - Live performances or installations
- Synchronize scent transitions with:
    - Music
    - Dialogue or mood shifts in film
    - VR environments
- Controlled via time-coded ultrasonic frequency emission to deliver precise scent sequences to audiences, potentially adapting in real-time.

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4. Scent Music as a Framework

Scent Music is the conceptual backbone of the system:

- **Scent Notes**: Single aromatic compounds that respond to distinct frequencies
- **Scent Chords**: Simultaneous activation of 2–3 frequencies to combine scents
- **Scent Melodies**: Time-sequenced frequency shifts to tell a scent story
- **Olfactory Instruments**: Piezo-driven emission units
- **Olfactory Tracks**: Pre-sequenced frequency files (like MIDI for the nose)

Technical Considerations

- **Ultrasonic Frequency Range**: 100 kHz – 2.5 MHz depending on compound density and volatility
- **Chamber Design**: Focused wave zones with thermal and acoustic insulation
- **Carrier Solutions**: PG, VG, ethanol, or water depending on target compound
- **Evaporation Precision**: Controlled by power modulation, resonance tuning, and surface area
- **Capsule Resonance Tuning**: For small-scale arrays, capsules are physically or chemically tuned to respond to specific frequencies, enabling multi-scent control using a single emitter
- **Single Piezo Control**: A single wideband piezoelectric emitter may generate composite waveforms to activate multiple target frequencies simultaneously, eliminating the need for multiple emitters in compact implementations
- **Direct Frequency-Based Excitation of Pure Aroma Molecules**: The system may also use pure, carrier-free aroma molecules in liquid or semi-liquid form. Each molecule or compound exhibits a unique resonance threshold under ultrasonic activation. The invention proposes a framework for mapping aroma molecules by frequency, density, and volatility to selectively evaporate or disperse individual aroma components using tuned ultrasonic signals.

Preliminary Resonance Mapping Example (Hypothetical Table)

Aroma Molecule	Estimated Density	Boiling Point	Hypothetical Resonant Frequency
Vanillin	1.06 g/cm³	~285°C	~680 kHz
Linalool	0.86 g/cm³	~198°C	~1.2 MHz
Patchoulol	0.99 g/cm³	~276°C	~450 kHz

Eugenol	1.06 g/cm³	~254°C	~730 kHz
Santalol (alpha)	0.96 g/cm³	~300°C	~410 kHz

These frequency estimates are illustrative only and intended to support further experimental calibration.

Purpose of Disclosure This document serves as a prior art disclosure of a novel frequency-selective olfactory delivery system capable of real-time, programmable, and emotionally resonant scent output. The system includes wearable and handheld personal devices, smart perfumes, and public-scale synchronized scent systems. It establishes the groundwork for a new category: programmable scent music, and introduces the concept of frequency-based molecular targeting for direct aroma excitation without carriers.